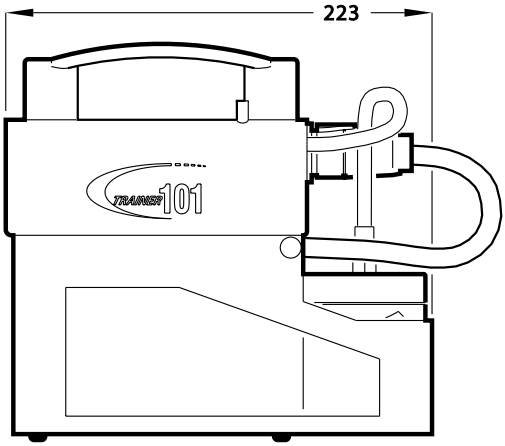
Trainer™

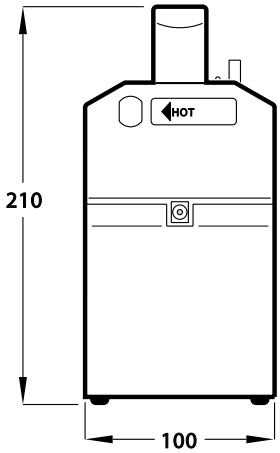
USER MANUAL

TRAINER 101

Dimensions

All dimensions are in millimeters





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P/N 35000179B / MSS 51310A

Safety information

The following symbols are used to identify important safety information in this manual:

Danger! Risk of personal injury.

Danger! Risk of electric shock.

Danger! Risk of fire.

Danger! Risk of fire or burns.

Caution! Corrosive substance. Risk of chemical burns.

DANGER! This product is not for household use.

Read this manual before operating the machine, follow the safety precautions listed below, and observe all warnings in this manual and printed on the machine. Use this machine only as described in this manual and in accordance with local laws and regulations.

If you have questions about how to operate the machine safely, please contact MSS Professional on (+44) 1604 839 000 or (+45) 87 400 000.

Preventing electric shocks

- The battery charger supplied with the machine is specifically designed for the machine's battery type. Do not use any other device to charge the machine's battery. Do not connect the charger to any other device.
- Before you use the charger, check that the voltage range indicated on the charger's label matches your local AC power voltage. If your AC power voltage is outside the range indicated, do not use the charger. Contact MSS Professional for assistance.
- If the charger or any cables connected to it are in any way damaged, defective, wet, or show signs of overheating, stop using the charger and contact MSS Professional for assistance.
- Disconnect the charger from AC power when not in use.
- Disconnect the charger and do not attempt to operate the machine when refilling the fluid container or servicing the machine.
- The battery charger is not waterproof. Do not allow it to get wet. Protect it from rain and water projections. Do not immerse it in water.

- Do not spill fluid over the machine. If fluid is spilled, make sure that the charger is not connected, and clean the machine with a damp cloth. If fluid is spilled onto internals or electronic parts, contact MSS Professional for assistance.
- Ensure that no condensation runs into the machine.
- There are no user-serviceable parts inside the battery charger or machine. Do not remove covers or attempt to repair a faulty charger or machine. Refer any service not described in this manual to MSS Professional.
- Do not operate the charger or machine if any parts are damaged, defective or missing.

Preventing burns and fire

- The smoke expelled from the output nozzle is hot enough to cause burns, and very hot droplets of fluid occasionally escape from the nozzle area. Keep people and objects at least 60 cm (24 inches) away from the nozzle (14).

- Do not touch the smoke output nozzle area (14) during use and for at least one hour after use; it may stay hot for some time after the machine has been used.

- Provide a minimum clearance of 10 cm (4 inches) around the machine and ensure free and unobstructed air flow to and around the machine.
- Keep the smoke machine at least 60 cm (24 inches) away from combustible and heat-sensitive materials.
- Do not attempt to bypass thermostatic switches or fuses.
- Replace fuses only with ones of the specified type and rating (FKS, 25 A, 32 V)
- Use the machine only with MSS Professional Trainer Fluid Medium.
- Do not operate the machine if the ambient temperature (Ta) is below 5° C (41° F) or above 45° C (113° F).
- Do not operate the machine if the relative air humidity exceeds 80%.
- Do not recycle dense smoke into the machine.
- Explosive gases can be produced if the machine's battery is overcharged. Only charge the battery in a well-ventilated area, and avoid open flames, sparks and other sources of ignition during charging.
- Disconnect the battery charger from AC power before connecting or disconnecting to the machine.
- Do not leave the machine unattended during charging.
- Do not charge or store the machine in a sealed container or enclosure.

- Do not short-circuit the battery, battery cables or connector.
- Do not modify the battery charger, battery pack, cables or machine in any way.
- If the battery bulges noticeably during charging, stop charging immediately and contact MSS Professional.

Preventing injuries

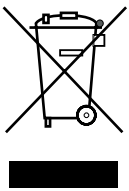
- Ensure that any surface on which the machine is placed can safely hold the weight of the machine.
- Do not point smoke output directly at a person's face or at face height.

- Smoke machines can cause condensation. If smoke concentration is high for extended periods, floors and surfaces may become slippery. Wipe dry as necessary to avoid any danger of slipping.
- Smoke fluid contains food-grade glycols in solution but may present health risks if swallowed. Do not drink it. Store it securely. If eye contact occurs, rinse with water. If fluid is swallowed, give water and obtain medical advice.
- The machine is equipped with a sealed gel-type lead-acid battery that is designed not to leak if punctured or damaged. However, if the battery is damaged, emission of harmful gases and minimal leakage of sulfuric acid may occur. Sulfuric acid is corrosive, and may cause irritation of eyes, nose and throat. Contact with eyes or skin may cause irritation or chemical burns. Flush any contacted areas with large amounts of water for at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary.
- Do not place the battery near a source of heat or attempt to burn it, as it may explode.
- Do not attempt to dismantle the battery.

Preventing breathing problems

- A smoke machine can operate safely only with the exact type of smoke fluid it was designed for. Use the machine only with MSS Professional Trainer Fluid Medium or you may cause the release of toxic gases, presenting a severe health hazard. You will also probably damage the machine.

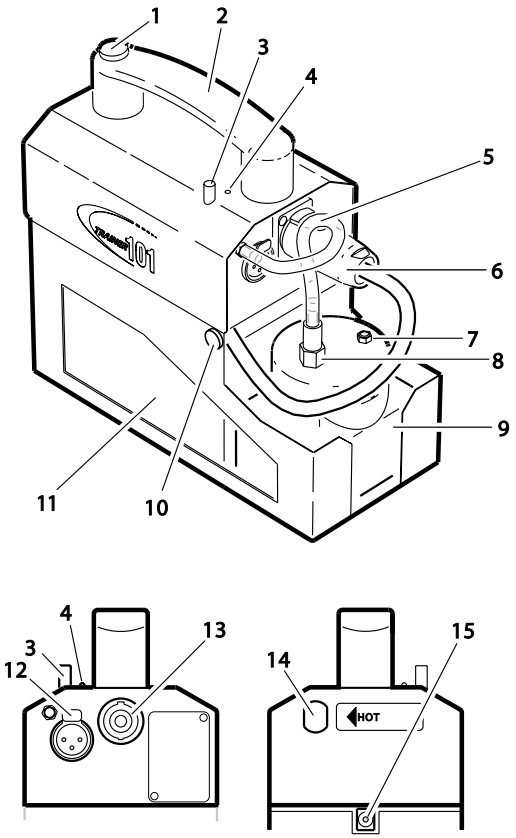
Disposing of this product



MSS Professional products are supplied in compliance with Directive 2002/96/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), as amended by Directive 2003/108/EC, where applicable.

Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal of MSS Professional products.

Overview



1 Start button
2 Carrying handle
3 Smoke output level adjuster
4 Battery status LED
5 Fluid transfer tube
6 Battery connector
7 Pressure relief valve
8 Transfer tube connector
9 Fluid container
10 Battery pack release thumbscrew
11 Battery pack
12 External control connector (XLR)
13 Battery connector socket
14 Smoke output nozzle
15 Batter charger socket

These items are referred to using numbers in brackets throughout this manual.

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Introduction

The Trainer 101 from MSS Professional is a compact and powerful hand-held smoke generator for simulation, training and commercial applications. Power is supplied by an integrated sealed battery, giving total freedom of movement to the operator. Smoke is produced within one second of pressing the start button, and smoke output can be varied from a light haze to a dense white smoke.

Details of the full range of MSS Professional products are available on the MSS Professional website at: http://www.training-smoke.com.

Features

The Trainer 101 features:

- Integrated battery and compact design for hand-held operation and operator mobility
- Dense white smoke at the touch of a button
- One second warm-up time
- Variable smoke output level
- Fail-safe thermal cut-out protection
- Advanced microprocessor control
- On-board quick-refillable fluid container
- Water-resistant, rugged design
- Microprocessor-controlled battery charger supplied
- Battery charge socket on front panel for easy access

Setup information

DANGER! Do not try to set up the Trainer 101 until you have read and observed all the precautions listed in "Safety information" on page 3.

Unpacking

The Trainer 101 is supplied with a battery pack (11) and smart battery charger.

The Trainer 101 is supplied with the smoke fluid container empty to avoid spillage during shipment. The container must be filled before using for the first time.

Handling and installation

The Trainer 101 may be either hand-held by an operator or placed on a surface in a static installation. If placing on a surface, ensure that the machine is secure and that the surface can safely hold the weight of the machine.

The fluid suction tube in the bottom of the fluid container must be immersed in smoke fluid during operation. Provided that this requirement is respected, the machine may be oriented as follows:

- During hand-held use, the machine may be temporarily held at any angle.
- In static installations, the machine may be permanently installed at any angle up to 30° from horizontal.

Provide a minimum clearance of 10 cm (4 inches) around the machine and ensure free and unobstructed air flow to and around the machine. Keep the smoke machine at least 60 cm (24 inches) away from combustible and heat-sensitive materials.

Do not point output directly at a person's face or at face height.

Do not expose the machine to vibration.

Filling the fluidcontainer

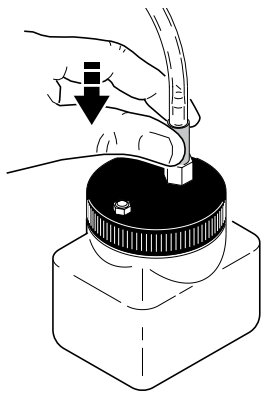
DANGER! A smoke machine can run safely only on the specific smoke fluid or fluids it is designed for. Use ONLY MSS Professional Trainer Fluid Medium in the Trainer 101. NEVER operate the machine with any other type of fluid, or toxic gas may be produced.
You will probably also cause damage to the machine that is not covered by the product warranty. Important!

<u>Important!</u> Keep smoke fluid and all components in the fluid system free of dust, dirt, fluff and any form of contamination.

Do not shake the fluid container or machine, as this will create air bubbles in the fluid. Excessive bubbles impair performance and may cause damage to the vaporizer that is not covered by the product warranty.

If fluid level is low, fill the fluid container (9):

1. Power off and disconnect the battery charger, if connected.
2. Remove the fluid transfer tube (5) from the transfer tube connector (8) in the fluid container cap by pushing down on the release collar (see illustration) until the tube pops up from the connector.
3. Remove the cap from the fluid container together with the fluid suction and pressure relief tubes.
4. Fill the container with MSS Professional Trainer Fluid Medium only. DO NOT use any other type of fluid.



Releasing the fluid transfer tube!

5. Check that fluid, container, suction tube and suction tube filter are totally free of dirt, fluff and other small particles. Even small impurities will clog the machine and make service or repair necessary.
6. Replace the cap tightly, ensuring that the suction tube reaches the bottom of the container.
7. Push the metal connector on the end of the fluid transfer tube into the transfer tube connector (8) in the fluid container cap. There should be an audible click when the connector snaps correctly into place. Check that the tube is held firmly.
8. When using the machine for the first time or after refilling, prime the pump by briefly operating the machine at full output level.

Battery

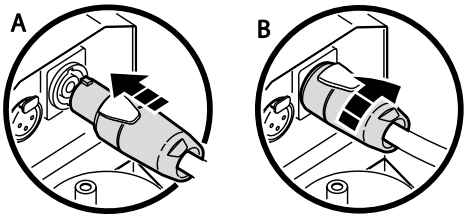
<u>Important!</u> Charge the battery fully and then disconnect the charger and battery connector before storing the machine. If a battery is stored in a discharged state, its capacity to hold a charge will be significantly reduced within two weeks.

The Trainer 101 is supplied with a 12 Ah capacity sealed gel-type leadacid battery (11). The battery is supplied fully charged. A completely discharged battery takes 10 - 12 hours to charge. A fully charged battery can generate more than 100 smoke emissions in 4 - 5 second bursts. One full charge gives a total of approximately 10 minutes of full smoke production. When charged and used correctly, the battery will hold its charge for several years and/or several hundred discharge/charge cycles. Having a fully charged spare battery available can help avoid delays.
Spare batteries are available from MSS Professional (P/N 92622022).

Connecting and disconnecting the battery

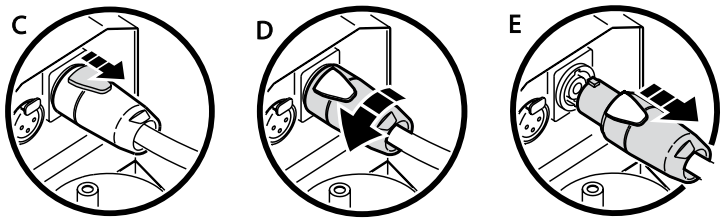
The battery connects to the machine via a Neutrik® NL4FX high-current locking connector.

See illustration below. To connect the battery, line up the lug on the connector with the cutout in the socket, push the connector into the socket (A) and twist the connector a few degrees clockwise (B) until an audible click is heard. The connector is now locked.



Connecting the battery

See illustration below. To disconnect the battery, pull the locking tab on the cable connector outwards (C), twist the connector a few degrees counterclockwise (D) and pull the connector out of the socket (E).



Disconnecting the battery

Battery charger

The Trainer 101 is supplied with a smart battery charger that automatically adjusts to accept 100 - 240 V, 50/60 Hz nominal AC power and adjusts the charging current to match the battery's state of charge. It takes 10 - 12 hours to fully charge a discharged battery.

To charge the battery:

1. Connect the battery charger to power.
2. Connect the output cable from the charger to the coaxial socket (13) on the front of the battery.
3. Check that the LED on the charger lights red to indicate charging.
4. When the LED on the charger lights green, the battery is fully charged.
5. Disconnect the charger from the battery.
6. Disconnect the charger from power.

If the LED on the battery charger lights red permanently:

- the battery may be too old and in need of replacement
- there may be a short circuit in the battery or charger output cables.

Connecting a remote control

An XLR connector (12) is provided to make the Trainer 101 ready for remote control. Contact MSS Professional if you wish to hear more about external control possibilities.

Operation

Pre-operation checks

DANGER! Do not try to operate the Trainer 101 until you have read and observed all the precautions listed in "Safety information" on page 3 and read "Setup information" on page 10.

IMPORTANT! Do not allow the Trainer 101 to run out of fluid, as this may cause serious damage to the product that is not covered by the warranty.

Before operating, check that:

- the battery is securely attached, sufficiently charged and correctly connected,
- the fluid container contains enough fluid (see "Checking fluid level" on page 15),
- the Trainer 101 is correctly and safely installed if it is in a static installation.

Operating the Trainer 101

To operate the Trainer 101, first connect the battery to the machine (see "Connecting and disconnecting the battery" on page 12). As soon as the battery connector is inserted in its socket and locked, battery power is supplied to the machine and the machine is ready for operation.

Controlling smoke output

To produce smoke, push the start button (1) on the carrying handle (2). Full smoke output is available after approximately 1 second warm-up time. Smoke output continues for several seconds after the start button is released.
To vary the quantity of smoke produced, turn the smoke output level adjuster (3) clockwise to increase output, and counterclockwise to reduce output.

Battery status

The yellow LED (4) on the top of the Trainer 101 indicates the state of charge of the battery:

- LED flashes slowly: battery capacity 15 - 100%, machine fully operational.
- LED flashes fast: battery capacity below 15%. Charge or change battery.
- LED lights permanently: battery flat or vaporizer damaged.
- LED does not light although battery is connected: machine in sleep mode.

Sleep mode

If smoke output is not activated for approximately 40 seconds, the Trainer 101 enters sleep mode in order to preserve battery charge. The Trainer 101 can remain In sleep mode for approximately 250 hours with a fully charged battery.

The Trainer 101 returns from sleep mode to operational mode as soon as the machine is fired by a press on the start button.

Checking fluid level

Important! Check the fluid level regularly and fill as necessary. Repeatedly attempting to operate the machine without fluid may cause damage that is not covered by the product warranty.

Check the fluid level in the translucent fluid container (9) regularly. Refill with smoke fluid as soon as there is a risk that the end of the suction tube in the bottom of the fluid container may not be completely immersed in smoke fluid.

If the fluid level is too low, fluid flow to the vaporizer will be insufficient, and a safety cutout will cut power to the vaporizer. The cutout protects the vaporizer under normal conditions, but repeatedly trying to operate the machine with insufficient fluid will eventually cause damage that is not covered by the product warranty.

If no smoke is produced when the start button is pressed, stop using the machine immediately and check the fluid level.

Service and maintenance

DANGER! Do not try to service the Trainer 101 until you have read and observed all the precautions listed in “Safety information” on page 3.

Any service not described in this section must be carried out by a service technician authorized by MSS Professional. Please refer to MSS Professional for assistance with obtaining service.

Replacing the battery pack

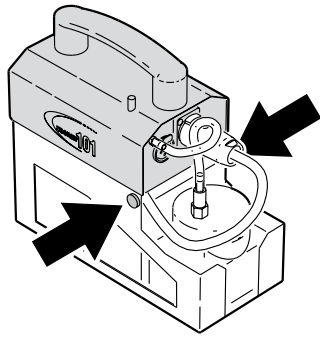
To remove a battery pack:

1. Place the Trainer 101 on a strong, stable flat surface.

2. Disconnect the battery connector (6) from its socket (13) on the connections panel and remove the fluid transfer tube (5) from the fluid container lid.

3. See illustration on right. Remove the two thumbscrews from the sides of the battery pack at the back of the machine. If the thumbscrews are stiff, press down on the machine’s handle to release the pressure on the screws.

4. Grasp the handle and hinge the back of the Trainer 101 up slightly at the same time as you pull it towards the back of the battery to release it. Lift the Trainer 101 clear, leaving the battery pack standing on the surface.



Battery release thumbscrews

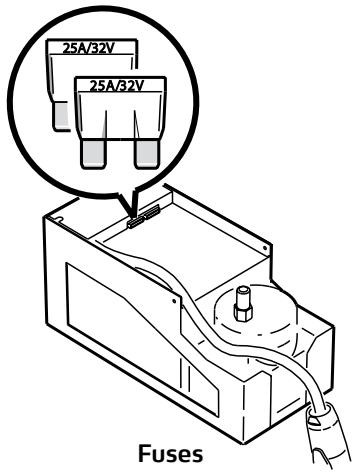
To install a battery pack, place it on a strong, stable flat surface and follow the above procedure in reverse. Press down firmly on the handle, if necessary, to ease replacement of the thumbscrews. Insert the thumbscrews squarely, taking care not to cross-thread them.

Replacing a fuse

DANGER! Do not attempt to bypass a fuse or replace a fuse with one of a different type and/or rating. If a new fuse blows shortly after it is installed, stop using the machine and contact MSS Professional for assistance.

If the machine is apparently dead although the battery is not flat, a fuse may have blown. To replace a fuse:

1. Disconnect the battery charger.
2. Remove the battery pack as described above.
3. See illustration on right. Two 25 A, 32 V automotive bladetype fuses are located on top of the battery pack. Replace with fuses of the same type and rating only.
4. Replace the battery pack described above.



Fuses

Cleaning

Wipe the Trainer 101 clean with a damp cloth periodically.
Do not use solvents.

If any dirt, dust, fluff or other particles are present in the smoke fluid, stop using the machine immediately and clean the fluid container, fluid filter and any contaminated tubes by rinsing in clean water.

Cleaning the fluid filter

A metal filter is threaded onto the end of the fluid suction tube in the fluid container. Periodically, or if any particles have got into the smoke fluid, unscrew the cap from the fluid container, unscrew the filter from the end of the tube and clean the filter by blowing through with compressed air and/or rinsing in clean water.

Troubleshooting

Problem	Probable cause(s)	Suggested remedy
No smoke output when machine is fired using start button (battery status LED is lit)	Low fluid level	Refill fluid container with MSS Professional Training Fluid Medium
	Battery flat (indicated by permanently lit battery status LED)	Recharge battery
	Airlock in pump	Prime pump by briefly operating machine at full output level.
	Wrong type of fluid used	Machine may be damaged. Consult MSS Professional
	Particles in fluid have caused blockage in machine	Consult MSS Professional dealer
	Malfunction	Consult MSS Professional dealer
No smoke output when machine is fired using start button (battery status LED is not lit)	Battery not correctly connected	Check that Neutrik® battery connector above fluid container is fully inserted and locked
	Malfunction	Consult MSS Professional dealer
Smoke disperses too quickly	Wrong type of fluid used	Consult MSS Professional dealer
Battery charger LED lights red permanently	Battery too old	Replace battery
	Battery or charger output cables short-circuited	Consult MSS Professional dealer

Specifications

Battery charger

Model MPP 15
Input voltage ..... 100 - 240 V AC nominal, 50/60 Hz
Output voltage ..... 12 VDC @ 1000 mA
Display ..... Charging status indicator (LED)
Dimensions (L x W x H) ..... 88 x 52 x 34 mm (3.5 x 2.0 x 1.4 in.)
Weight ..... 165 g (6 oz.)
Minimum ambient temperature ..... 0° C (32° F)
Maximum ambient temperature ..... 40° C (104° F)
Approvals ..... UL (Canada & USA), CE, GS, DVE, FWGB

Trainer 101

Physical

Dimensions (L x W x H) ..... 223 x 100 x 210 mm (8.9 x 4.0 x 8.3 in.)
Dry weight including battery ..... 5.6 kg (12.4 lbs)
Construction ..... Steel, aluminium, thermoplastic

Performance

Warm-up time ..... 1 second
Total output time, max. output level, per battery charge ..... 10 minutes approx.
Standby time ..... 250 hours

Control

Instant smoke output push-button
Output level adjustment
Battery charge status indicator (LED)

Installation

Orientation (hand-held use) ..... Any
Orientation (permanent fixed installation) ..... Maximum 30° from horizontal
Minimum clearance in front of output nozzle ..... 60 cm (24 inches)
Minimum clearance around machine ..... 10 cm (4 inches)
Minimum distance from combustible materials ..... 60 cm (24 inches)
Minimum ambient temperature ..... 5° C (41° F)
Maximum ambient temperature ..... 45° C (113° F)

Electrical

Power rating ..... 400 watt
Power source ..... Integral 12 Ah sealed lead-acid gel-type battery
Input voltage ..... 12 VDC
Primary fuses ..... Two automotive blade-type (FKS), 25 A, 32 V

Smoke fluid system

Approved fluid type ..... MSS Professional Trainer Fluid Medium
On-board fluid capacity ..... 0.25 liter (0.53 US pint / 0.44 imperial pint)
Fluid consumption at max. continuous output ..... 10 ml per minute
Maximum operating time at full output ..... Approx. 25 minutes
Heat exchanger temperature control ..... Microprocessor

Connections

External control input ..... 3-pin locking XLR
Battery charger input ..... Coaxial
Integral battery pack ..... Neutrik® Speakon® NL4FX

Included items

Smart battery charger
Microprocessor-controlled, 12 Ah, sealed gel lead-acid type battery in pack

Warranty

There is a 2 years warranty on this product EXCEPT for the battery and vaporizer for which there is NO warranty

Accessories

MSS Professional Trainer Fluid Medium:
2.5 liter (5.3 US pint / 4.4 Imp. pint) container ..... P/N 97121223
9.5 liter (2.5 US gallon / 2.1 Imp. gallon) container ..... P/N 97121224
25 liter (6.6 US gallon / 5.5 Imp. gallon) container ..... P/N 97121225
Spare battery pack ..... P/N 92622022

Ordering information

MSS Professional Trainer 101 ..... P/N 92256000

Specifications subject to change without notice

Supplier

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